
Memo: M001-C

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Caravan, Manchester Good Yards

Operational noise breakout assessment

This memo provides an assessment of operational noise levels and changes to the building envelope at the proposed development at Caravan, Manchester Good Yard to discharge Planning Condition 3a under 139384/FO/2024. In summary:

- The predicted transfer noise levels in the office above are compatible with the proposed amplified sound level criteria.
- The predicted noise breakout level via the restaurant facade at the nearest noise sensitive premises exceeds the day and night limits. Maximum amplified sound limits have been set out.
- It is understood that during summer months, the windows may be retracted for the unit. Appropriate limits for amplified sound (in line with low level background music) have been set.
- Customer noise breakout associated with patrons talking have been assessed in Sandy Brown 023622 M002-B *Patron noise egress assessment*, dated 7 June 2024.
- Loudspeakers within the unit are not proposed be rigidly mounted to the soffit or structural elements to minimise the risk of structure-borne noise transfer. A well-distributed and directional loudspeaker system is proposed to minimise breakout/spillage out of the open facade.
- The Operational Management Plant for Caravan, Manchester Goods Yard states that a sound limiter will be utilised to ensure that any amplified sound from within the premises does not exceed the maximum amplified sound levels with retractable windows open.

On the basis that a sound limiter is installed to meet the amplified sound limits set out when windows are open and closed, the noise levels at the nearest noise sensitive premises are expected to comply with the noise egress limits set out, and Planning Condition 3a can be discharged.

Planning Condition 3b requires post completion testing to confirm that noise limits at the nearest noise sensitive premises are met.

Basis

This memo is based on the following information:

- Sandy Brown report 22195-R01-C *Acoustic design review* dated 21 September 2022
- Proposed operational noise levels received in Acoustic assessment of sound insulation at 152-156 Great Portland Street, London report reference: 180407-R001A dated May 2017
- Proposed door sound insulation performance received from Allied London via email on 3 August 2023
- Proposed layout set out in 261CSC-CTA-XX-L00-DR-A-209000-T02
- Sandy Brown 18346-R01-A *Acoustic planning report* dated 28 September 2018
- Planning Conditions under 139384/FO/2024 publicly available online in Manchester City Council Planning portal.

Planning Conditions

Planning Condition 3a and 3b under 139384/FO/2024 state the following:

Planning Condition 3a

‘The premises shall be acoustically insulated and treated to limit the breakout of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the used commences. Where entertainment noise is proposed the L_{Aeq} (entertainment noise) shall be controlled to 5 dB above the L_{A90} (without entertainment noise) in each octave bands at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63Hz and 125 Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47 dB and 41 dB ($L_{eq, 5min}$), respectively’.

Planning Condition 3b

‘Prior occupation of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant’s report. The report shall also undertake post completion testing to confirm that acceptable criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria’.

Acoustic criteria

Background noise levels

An environmental noise survey has been carried out by Sandy Brown, the measurement results are noise egress limits are set out in 18346-R01-A *Acoustic planning report* dated 28 September 2018.

The lowest background noise levels measured during the survey at the nearest noise sensitive premises was $L_{Aeq,5min}$ 50 dB during the day and $L_{Aeq,5min}$ 44 dB at night.

The octave band sound pressure levels corresponding to the minimum background L_{A90} (dB) level measured are provided in Table 1.

Table 1 Octave band background noise levels for lowest measured background noise levels

Time period	Minimum background noise level, $L_{90,5min}$ (dB)						
	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Daytime (07:00 – 23:00)	52	49	48	43	47	41	27
Night-time (23:00 – 07:00)	49	46	44	39	39	34	24

Noise breakout

The operational noise egress criteria (associated with amplified sound) are provided in Table 2. These limits apply at the surrounding noise sensitive premises. The nearest noise sensitive premises during the day (07:00-23:00) and at night (23:00-07:00) are considered to be Nickel & Dime (East Tower) and Marriot Hotel.

Table 2 Maximum amplified sound egress limits at noise sensitive premises

Time period	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{eq,5min}$ (dB)						
	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Daytime (07:00 – 23:00)	39	36	35	30	34	28	14
Night-time (23:00 – 07:00)	36	33	31	26	26	21	11

Internal noise transfer

For the purpose of assessing operational noise transfer, a typical NR 35 FCU spectrum has been considered within the Level 1 tenant unit. This is considered a reasonable worst-case scenario, as such noise levels would be expected within cellular meeting rooms and offices, which would

be considered acoustically sensitive spaces. The spectrum considered is provided in Table 3 for reference.

Table 3 NR35 FCU sound pressure spectrum

	Sound pressure level L_{eq} (dB)							
	Octave-band centre frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
NR 35 FCU spectrum	42	39	39	35	35	32	27	23

Operational noise transfer to the Level 1 tenant unit from the Caravan demise will need to be suitably controlled such that it does not result in disturbance to its occupants. It is recommended that operational noise transfer be controlled to be at least 10 dB below the internal noise levels within the Level 1 tenant unit in each octave band as per Table 3.

Operational noise levels

Based on the received information, and in line with measured typical restaurant amplified sound levels (stated in ACAacoustics report) it is understood that typical restaurant measured noise levels in an existing Caravan restaurant is L_{Aeq} 81 dB, with representative octave band levels set out in Table 4.

The results in the ACAacoustics report are reported to be as L_{Aeq} per octave band. This appears to be a typo and the octave band data refers to L_{eq} (dB) but this should be confirmed with the tenant.

Table 4 Measured amplified sound levels in existing caravan restaurant

	Sound pressure level L_{eq} (dB)						
	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Measured amplified sound levels in existing caravan restaurant	80	77	76	80	78	71	64

Operational noise transfer assessment

This assessment only considers noise transfer to office spaces in the level directly above the proposed Caravan restaurant. Noise transfer to back of house spaces are not considered acoustically sensitive.

Based on measured floor sound insulation performance between ground level and office space for another Manchester Good Yard project (Fenix, Manchester Goods Yard) the measured in-situ airborne sound insulation performance is $D_{nT,w}+C_{tr}$ 53 dB. This has formed the basis of the assessment.

The predicted noise transfer level is NR 23 with the following predicted octave band levels.

Table 5 Predicted internal noise levels from proposed operational levels at caravan restaurant

	Sound pressure level L_{eq} (dB)						
	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Predicted internal noise level transfer in office above restaurant	46	39	29	27	18	7	0

The predicted results in the office spaces above meet the noise transfer criteria set out above without additional mitigation measures.

Although not a requirements for office space, the predicted results are below MCC low frequency criteria of 47 dB at 63 Hz and 41 dB at 125 Hz octave bands for residential developments structurally connected to entertainment venues.

Loudspeakers within the unit should not be rigidly mounted to the soffit or structural elements to minimise the risk of structure-borne noise transfer.

Operational noise egress assessment

Retractable windows/doors closed

This section presents a noise egress assessment via the facade based on the proposed operational levels at Caravan restaurant.

It is understood that the tenant has requested retractable windows/doors to the long side of the restaurant to the south, this is highlighted in blue in Figure 1.

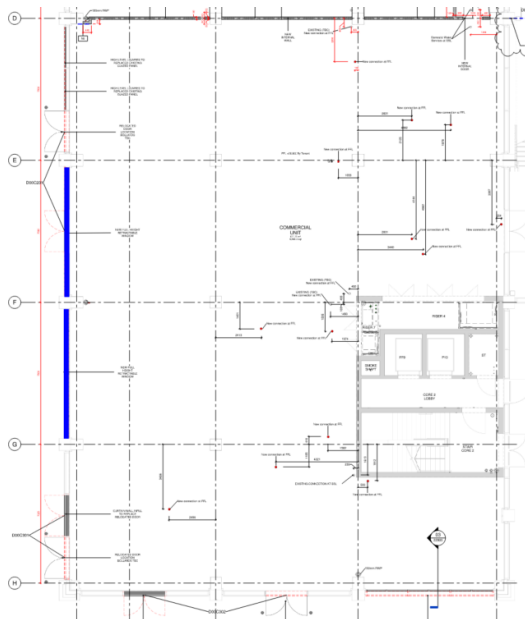


Figure 1 Excerpt of drawing 261CSC-CTA-XX-L00-DR-A-20900-T02

It is also understood that the doors and/or windows may be kept open on summer days. Cumulative operational noise egress criteria for Caravan restaurant are set out in Table 2.

Table 6 Sound insulation performance of proposed restaurant door

	Sound insulation performance R_w (dB)						
	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Door sound insulation performance	20	17	23	29	31	31	33

- Amplified sound levels set out in Table 4
- Overall facade sound insulation performance assumed to be similar to the proposed door performance (worst-case scenario) including the proposed retractable window
- Doors and retractable windows closed
- Nearest noise sensitive premises location in relation to each Caravan restaurant facade and screening were relevant

The predicted cumulative noise egress from the proposed operational levels are set out in Table 7.

Table 7 Predicted noise egress level at the nearest noise sensitive premises

	Sound pressure level L_{eq} (dB)						
	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Nickel & Dime (East Tower)	49	49	43	40	36	30	20
Marriot Hotel	44	44	38	35	31	24	15

The predicted noise levels exceed the limits set out in Table 2. To meet the limits at the nearest noise sensitive premises, maximum amplified sound levels are set out in Table 8.

Table 8 Maximum amplified sound levels

	Maximum sound pressure level L_{eq} (dB)						
	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Day (07:00 – 23:00)	70	64	68	70	76	69	58
Night (23:00 – 07:00)	67	61	64	66	67	62	55

The day noise levels result in L_{Aeq} 76 dB and the night noise levels result in L_{Aeq} 70 dB, these are considered suitable for a restaurant environment. It has been confirmed that a music limiter will be installed to ensure limits set out in Table 6 and Table 7 are met.

Based on the above it is recommended that a sound limiter be provided to achieve the above amplified sound levels.

Retractable windows open

Limits for amplified music within the unit with the retractable doors and windows open are set out in Table 9. These equate to low level background music during the day only.

Table 9 Maximum amplified sound levels with retractable windows open

	Maximum sound pressure level L_{eq} (dB)						
	Octave-band centre frequency (Hz)						
	63	125	250	500	1000	2000	4000
Day (07:00 – 23:00)	63	60	59	54	58	52	38
Night (23:00 – 07:00)	60	57	55	50	50	45	35

A well-distributed and directional loudspeaker system is proposed to minimise breakout/spillage out of the open facade.

To ensure the limits of amplified music set out in Table 9 are met, the Operational Management Plan for Caravan, Manchester Goods Yard states the following on page 3 under 'Utilization of Retractable Windows':

'When the windows are in use, a sound limiter will be utilised to ensure that any amplified sound from within the premises does not exceed the permitted levels as determined in the attached report prepared by Sandy Brown'.

On the basis that amplified music limits set out with the windows closed and retracted are met, Planning Condition 3a can be discharged.

Planning Condition 3b requires post completion testing to confirm that noise limits at the nearest noise sensitive premises are met.

Customer noise breakout associated with patrons talking have been assessed in Sandy Brown 023622 M002-B *Patron noise egress assessment*, dated 7 June 2024.